

## AC TRANSIT TAKING THE HyROAD

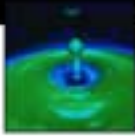
Jaimie Levin

Director of Marketing & Communications

Alameda-Contra Costa Transit District

Oakland, California





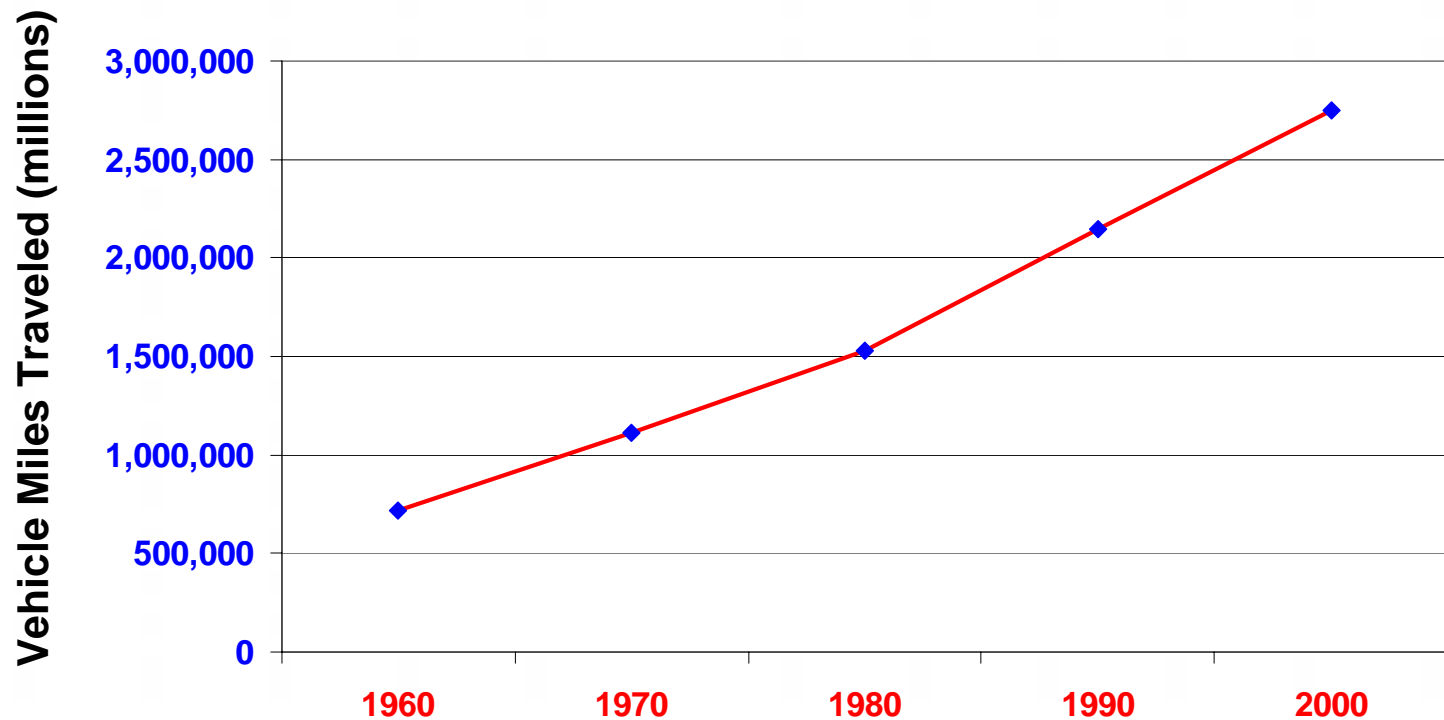
# Public Transportation, Mobility, and Reducing Oil Consumption: **Can Transit Really Make a Difference?**

# Public Transit Mantra: **Ridership is Up!**

- 18% reduction in service hours since 2002
- Ridership up 7% from 60 million passengers in FY2003 to 64 million passengers in FY2004

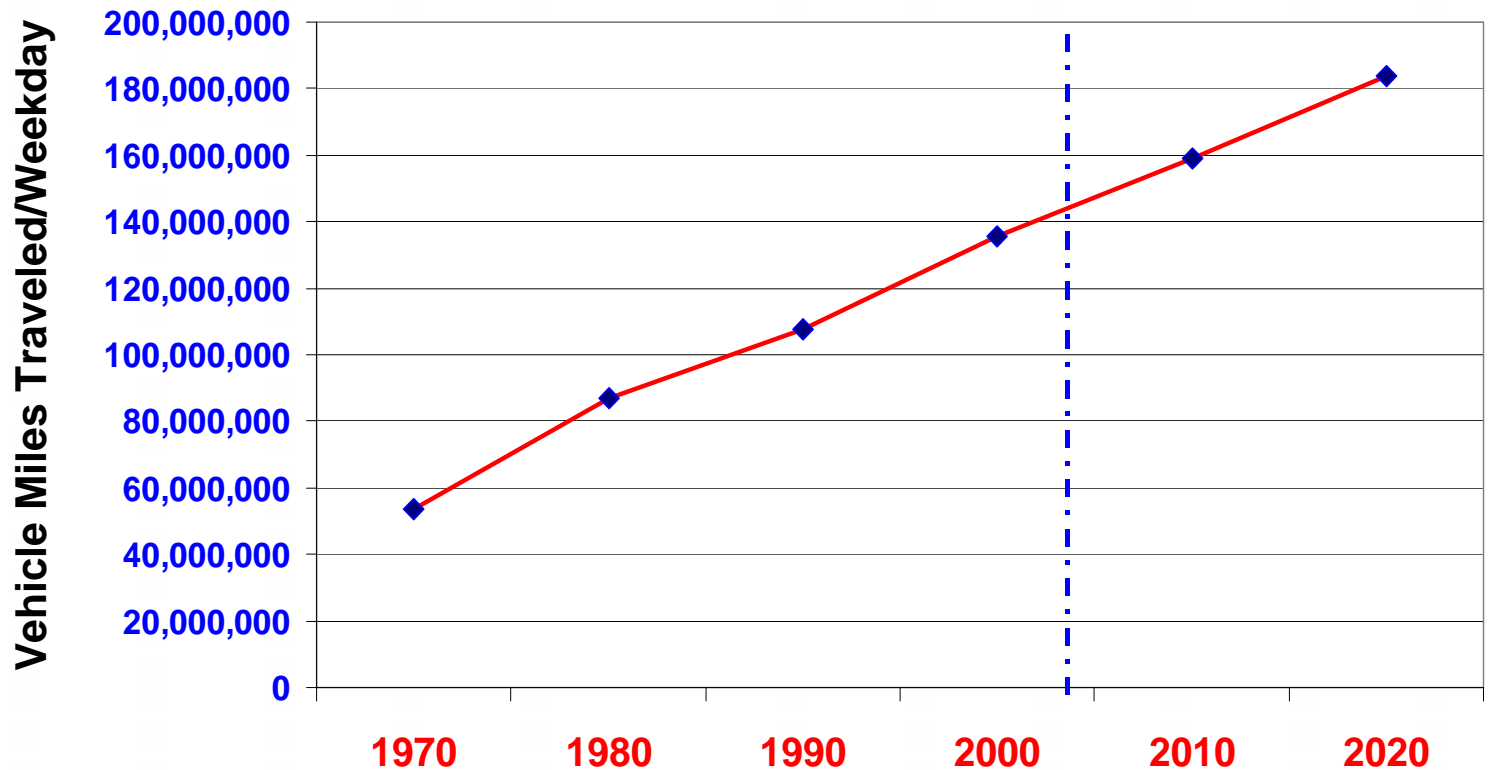


# United States VMT Growth



Source: U.S. Department of Transportation

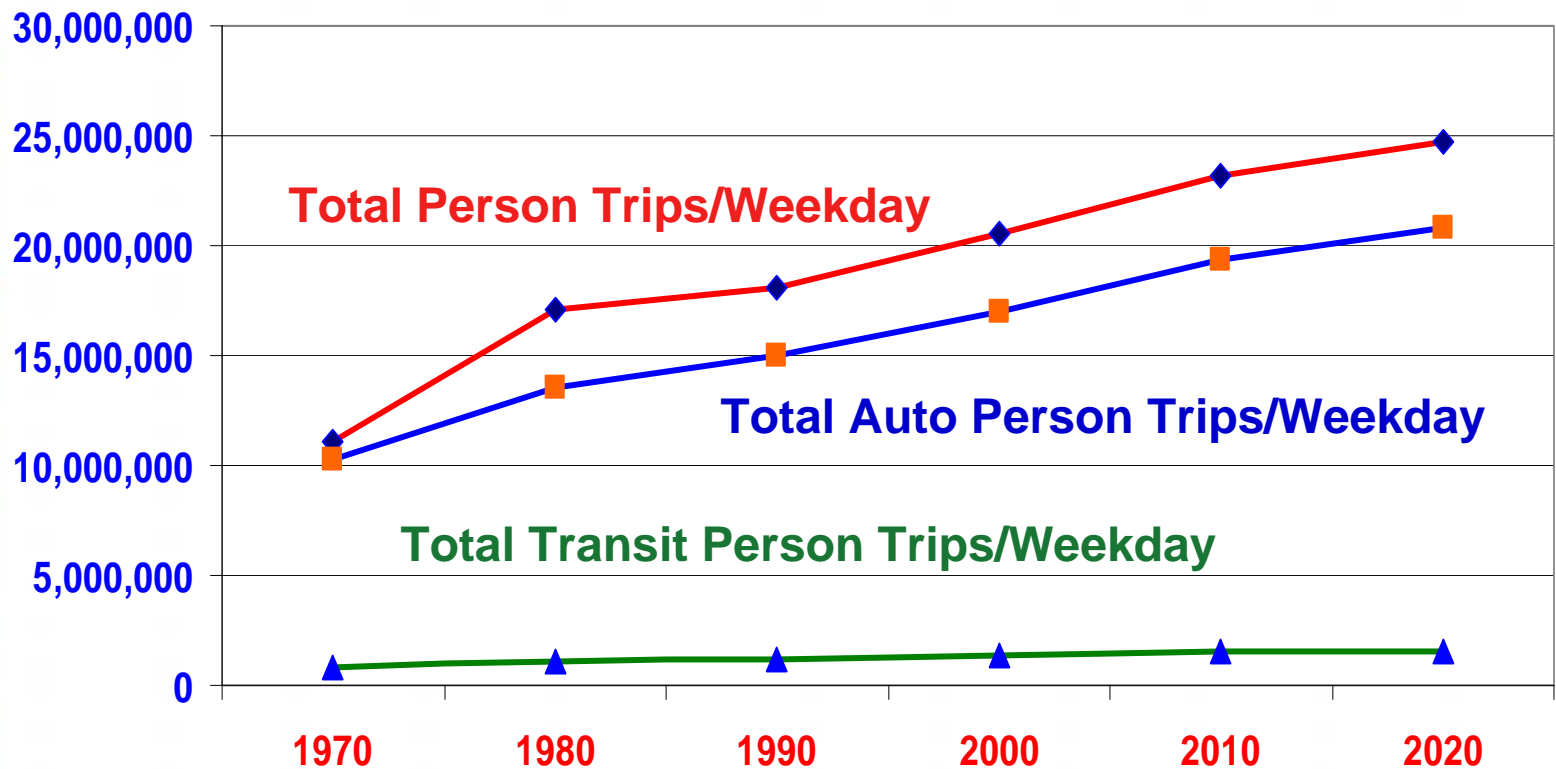
# Bay Area VMT Growth



Source: SF Bay Area MTC



# Bay Area Transit Market Share



Source: SF Bay Area MTC



# Travel-to-Work Market Share

Metropolitan Area	Public Transit Market Share: 2000	1990	Change: 1990 - 2000
New York/Northern NJ/Long Island	24.9%		
Chicago/Gary/Kenosha	11.5%		
San Francisco/Oakland/San Jose	9.5%		
Washington/Baltimore	9.4%		
Boston/Worcester/Lawrence	9.0%		
Philadelphia/Wilmington/Atlantic City	8.7%		
Honolulu	8.3%		
Seattle/Tacoma/Bremerton	6.8%		
Pittsburgh	6.2%		
Portland/Salem	5.7%		
California - Transit Share	5.1%	5.3%	-0.5%
California - Drive Alone Share	71.8%		
United States - Transit Share	4.7%		
United States - Drive Alone Share	75.7%		

Source: U.S. Census Journey to Work: 2000

# Transit Making A Difference

- **Accessibility**
  - **Convenience**
  - **Travel Time**
  - **Comfort (Image)**
  - **Technology**
  - **Political/Financial Support**
- Service**



## Accessibility: Critical Mass

- **Land use** generates trips and largely determines travel behavior (“*Design with Transit: Making Transit Integral to East Bay Communities*”)
- Transportation Systems provide **mobility and access and influence land-use patterns**
- **Critical mass** (population and density) and mixed-use development are necessary to achieve sustainable and efficient transport

# AC Transit Regional Role

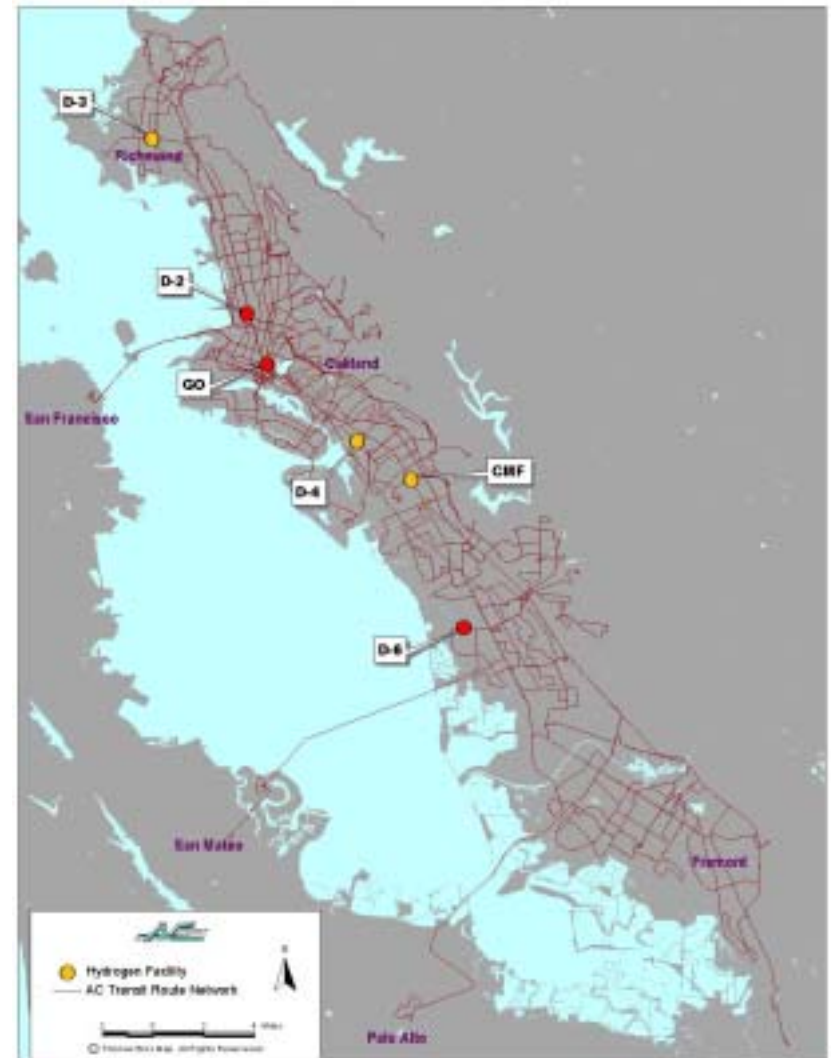
## One of 14 transit operators

- » San Francisco MUNI
- » BART (Capitol Corridor)
- » **AC Transit**
- » VTA
- » Samtrans
- » Caltrain
- » Golden Gate
- » County Connection
- » ACE
- » Wheels, Tri Delta, Vallejo, WestCAT



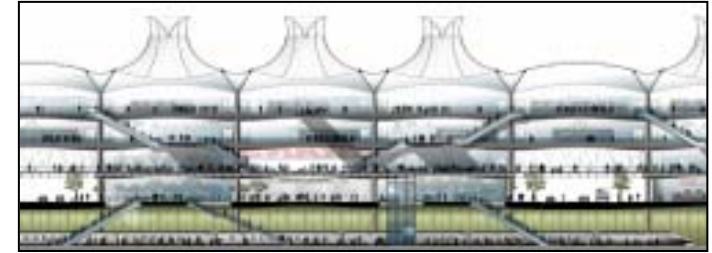
## Service Area

- Serving **1.5 million people** in 13 cities
- **64 million passengers**
- **696 buses**
- **2,302 employees**
- **\$250 million budget**
- 105 lines (27 transbay)



# Service

- Transbay Terminal
- Express Buses
- BRT Corridors
- Car Share Services
- Translink
- EcoPass
- Point of Travel Info
- GPS Tracking





# H<sub>2</sub> and Hybrid Technology

- Ballard ZEBus Test – November 1999
  - » 75 mph road test
  - » Climbed 12% grades
- Mercedes NeBus – 2000
- CaFCP – 2000 (Demo Commercial Viability)
- ISE/UTC Thor Bus – 2003/2004



# Funding an R&D Program

- \$20 million Demonstration Project
- Financial Partners
  - » Caltrans
  - » California Air Resources Board
  - » ChevronTexaco
  - » Bay Area Air Quality Management District
  - » DOT/Federal Transit Administration
  - » California Energy Commission
  - » Department of Energy
  - » Stuart Energy
  - » CalSTART

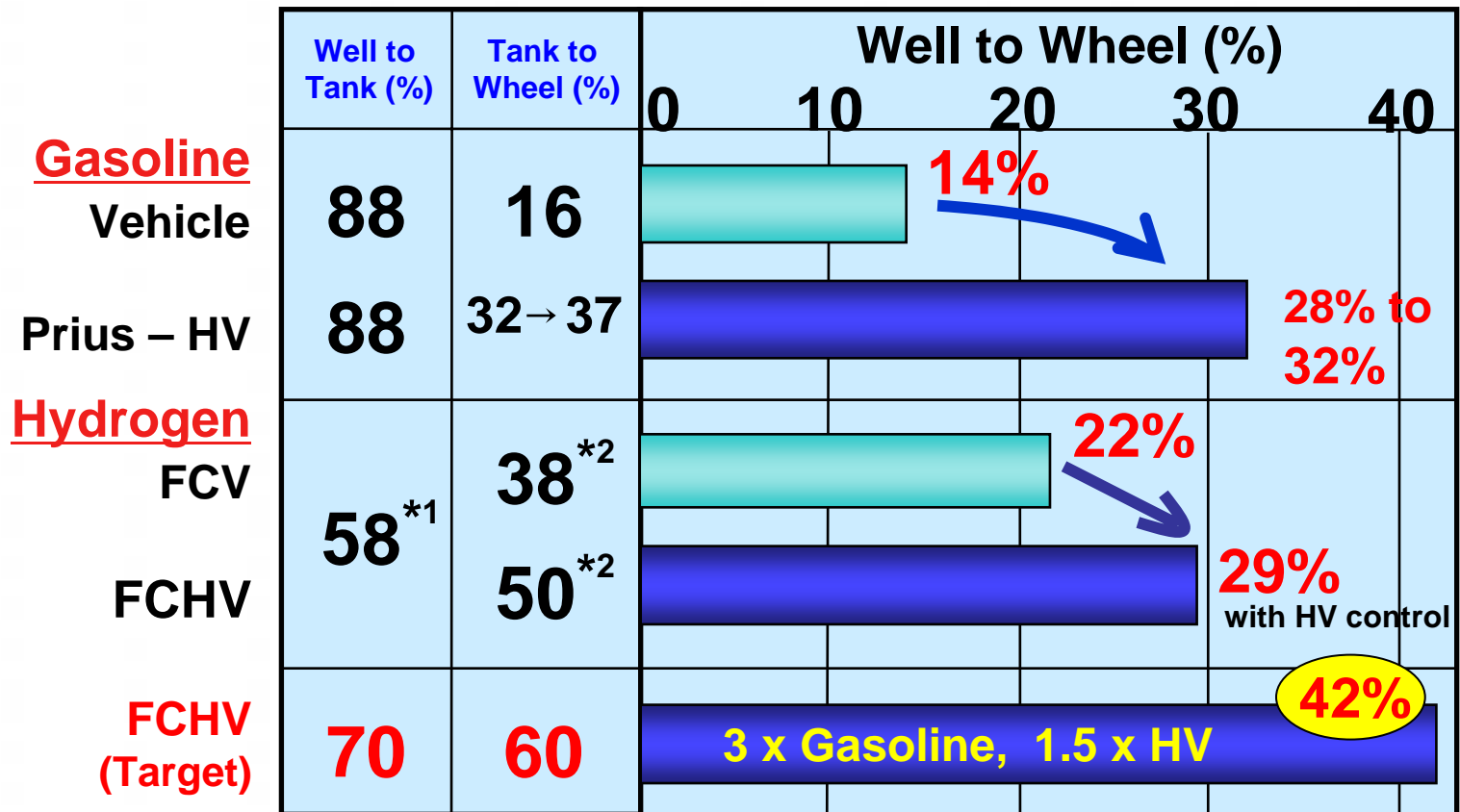
## What Motivates Us?

- **Public Health:** urban centers/people at risk
- **Quality of Life:** quiet operation
- **Cost Savings:** Reduced life cycle costs
- **Renewable and sustainable energy**
- **Energy independence:** economic stability and reduction in petroleum imports
- **Reduction in global warming**



TOYOTA

## 2x to 3x Fuel Efficiency



\*1 Natural gas base

\*2 Measurement from the electric current

■ Toyota's estimation





# Why Transit?

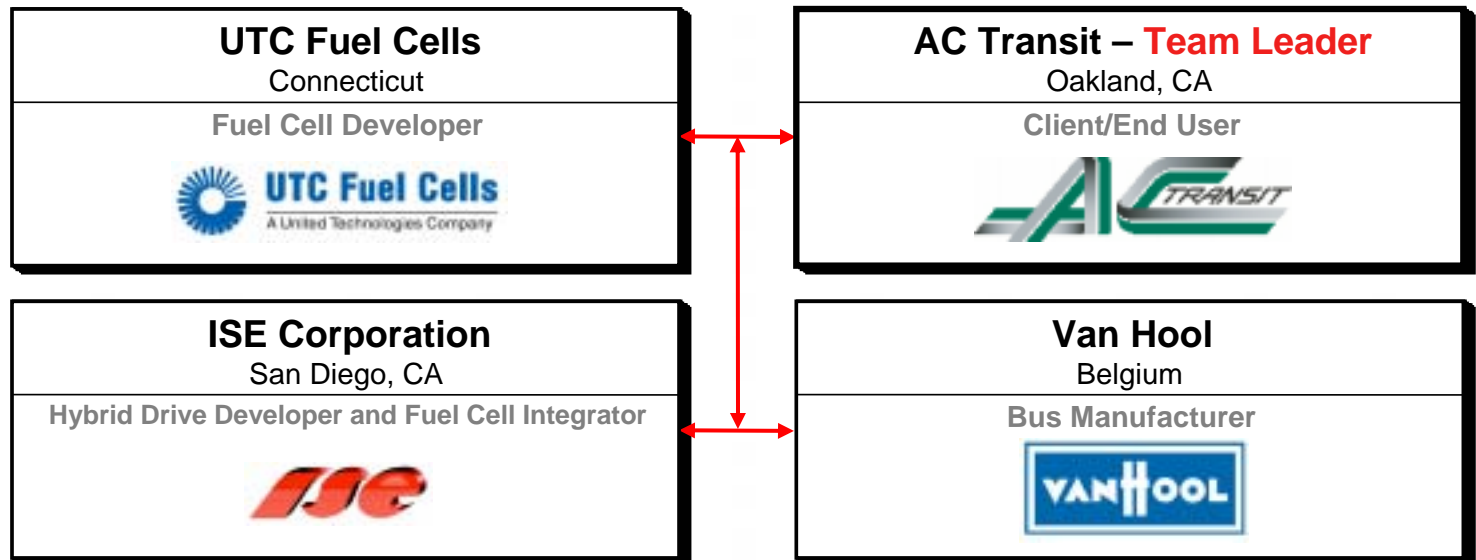
## An Ideal Test Bed

- » **Testing the limits:** fuel cell performance under heavy-duty, rigorous operating conditions (stop-and-go traffic)
- » **Centralized** maintenance and fueling
- » **Professional** staff and training
- » **Excellent visibility** and extensive public exposure



# Partnering

## Model Development Team



## 3 – 40' Buses: Fall 2005

### IMPORTANT NOTE

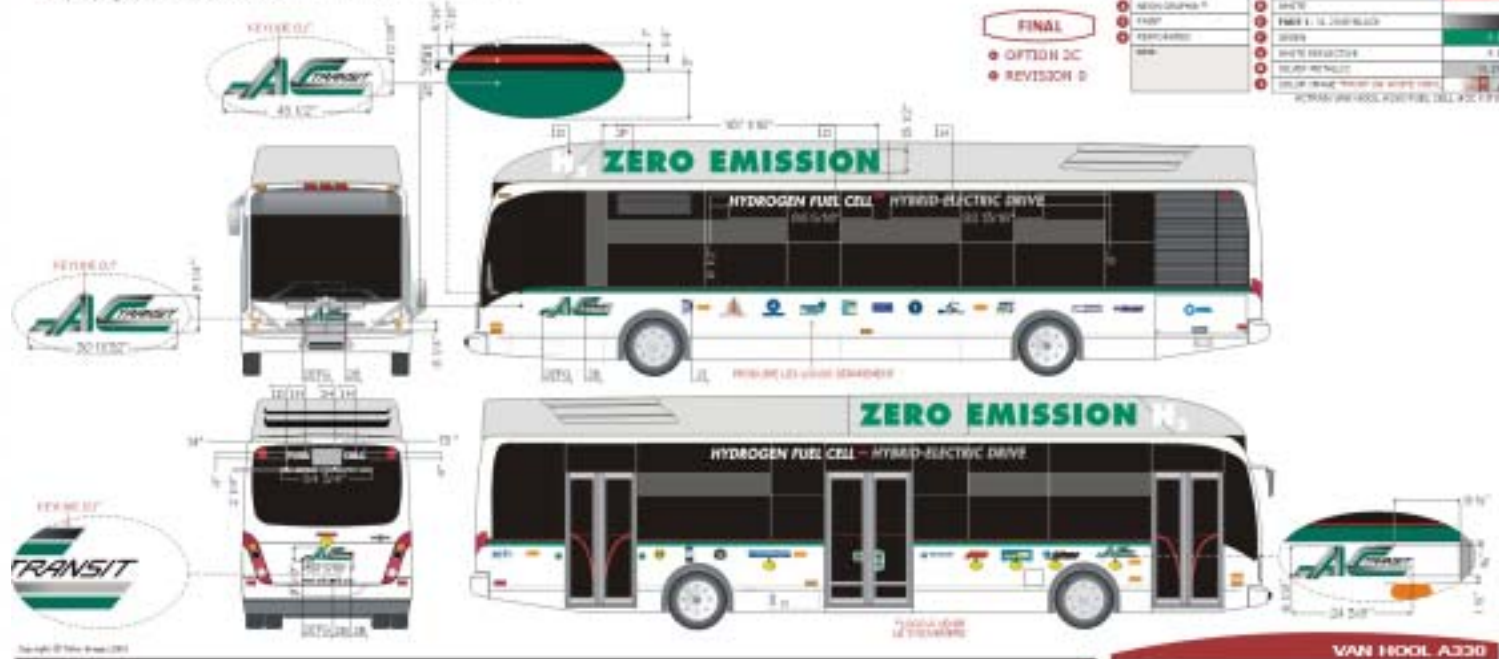
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\$1,000

**FINAL**  
• OPTION DC  
• REVISION 0

### NEUTRAL & COLOR SPECIFICATIONS

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VAN HOOL A330



## 30' ISE Prototype Bus

- September 2003 – October 2004
- Utilized for Training, E&O, and Revenue Service
- 7,600 Revenue Service Miles
- **83% Availability**
- **7.5 mpg equivalent**





# DOE Light-Duty Demonstration

- 10 Hyundai Tuscon Fuel Cell SUVs, 2005-2009
- Operated by AC Transit Road Supervisors



ChevronTexaco



# Richmond Hydrogen Station

- Startup – October 2002
- Partnership with Stuart Energy and CaFCP
- Onsite Water Electrolysis

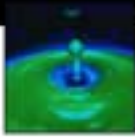


# Oakland Energy Station



Mobile Fueler

- Scheduled startup – August 2005
- Partnership with ChevronTexaco and Oakland
- Onsite Natural Gas Reformer
- **Stationary Fuel Cell – Facility Power**
- Maintenance Center for Buses



It's an aging process, and we're going to build an environmentally friendly fleet of hydrogen-powered vehicles without the energy stations in place? But who's in the

hydrogen along stores? Who's enough? vehicles are on the road to make it worthwhile? So which comes first, the chicken or the egg? At ChevronTexaco, we're jump-starting

things by partnering with the US Department of Energy and AC Transit of California. Together, we're integrating new technologies with the existing natural gas distribution network

to create a prototype hydrogen energy station, opening business in 2003. By using this practical approach to build stations, we'll find our way to building a better tomorrow.



[www.chevrontexaco.com/technology.asp](http://www.chevrontexaco.com/technology.asp)

**Chevrontexaco**  
Turning partnership into energy.

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# Governor's Hydrogen Highway



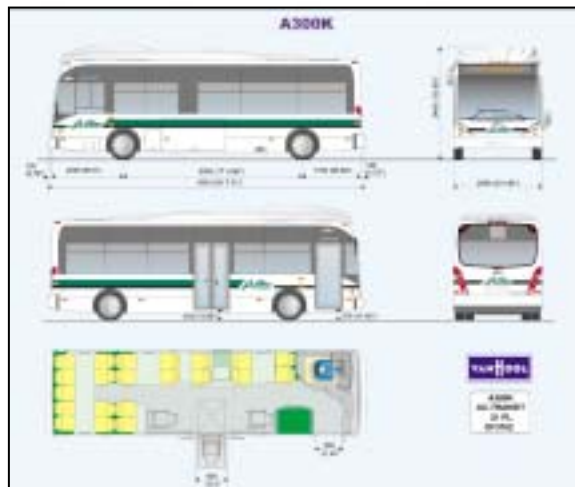
# Timeline

- 30' Prototype Demonstration (2003/2004)
- 40' Bus Evaluation (2005-2008)
- Upgrade technology/expand fleet size (>2008)
- CARB Regulations: If demonstration is successful,  
15% or more of new purchases, ZEB (~ >2010)



## What Do We Do Now?

- **Clean Diesel** – Aftertreatment traps (NOx 25%; PM 85%; 90% HC/CO) and clean fuel (15 ppm)
- **Gasoline Hybrids** (30' neighborhood buses)
- **Hydrogen ICE Hybrid**



## Closing The Cost Gap

- AC Transit Fuel Cell Bus \$3.1m
- AC Transit Diesel Bus \$325k
- ACT 30' Gasoline **Hybrid** \$400k (+\$100K)
- Seattle 60' Diesel **Hybrid** \$645k (+\$200k)
- SF Muni 40' **Trolley Bus** **\$800k**
- Boston 40' **Trolley Bus** **>\$1m**
- **ACT 40' H<sub>2</sub> ICE Hybrid** **~\$800k**



## Sustaining Our Program

- Transit: **Service before Technology**
- Government **Financial Support**: Bridging the Development Gap
  - » Upgrade systems
  - » Expand fleet size
- **Continuing Stream** of Capital: Bridging the Service Gap



# Tracking Our Progress

www.actransit.org

